

CLAIMS

1. A method for identifying a polypeptide of a microorganism which polypeptide is associated with an immune response in an animal which has been subjected to the microorganism, the method comprising the steps of
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- (1) providing a plurality of different mutants of the microorganism;
- (2) contacting the plurality of mutant microorganisms with antibodies from an animal which has raised an immune response to the microorganism or a part thereof, under conditions whereby if the antibodies bind to the mutant microorganism the mutant microorganism is killed;
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- (3) selecting surviving mutant microorganisms from step (2);
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- (4) identifying the gene containing the mutation in any surviving mutant microorganism; and
- (5) identifying the polypeptide encoded by the gene.
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2. A method according to Claim 1 wherein the microorganism is a pathogenic microorganism.
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3. A method according to Claim 1 or 2 wherein the animal subjected to the microorganism is a host of the microorganism.
4. A method according to any of Claims 1 to 3 wherein the animal subjected to the microorganism is a human who is or has been infected with the microorganism.
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5. A method according to any of the preceding claims wherein the microorganism is a bacterium.
6. A method according to Claim 5 wherein the bacterium is *Neisseria meningitidis*.
7. A method according to any of the preceding claims wherein the mutant microorganisms have insertional mutations.
8. A method according to any of the preceding claims wherein any surviving mutant selected in step (3) is backcrossed into a parental strain of the microorganism and it is determined whether the resulting cross is resistant to killing under conditions as set out in step (2).
9. A method according any one of the preceding claims wherein in step (2) complement mediates killing of the microorganisms to which the antibodies are bound.
10. A method of identifying a gene encoding a polypeptide of a microorganism which polypeptide is associated with an immune response in an animal which has been subjected to the microorganism, the method comprising carrying out steps (1) to (4) as defined in Claim 1.
11. A method of selecting a microorganism mutated in a gene encoding a polypeptide which polypeptide is associated with an immune response in an animal which has been subjected to the microorganism, the method comprising carrying out steps (1) to (3) as defined in Claim 1.
12. A method for making an antigen the method comprising carrying out the method according to any of Claims 1 to 9 and synthesising the polypeptide identified in step (5) or an antigenic fragment or variant thereof, or fusion of such polypeptide or fragment or variant.

13. A method according to Claim 12 wherein the variant is a homologous polypeptide from a related microorganism.
- 5 14. A method for making a vaccine for combating a microorganism the method comprising making an antigen according to the method of Claim 12 or 13 or polynucleotide encoding said antigen and combining the antigen or polynucleotide, with a suitable carrier.
- 10 15. A method according to Claim 14 wherein the antigen or polynucleotide is combined with an adjuvant.
16. An antigen obtainable according to the method of Claim 12 or 13 or a polynucleotide encoding said antigen.
- 15 17. A vaccine obtainable by the method of Claims 14 or 15.
18. An antigen or polynucleotide according to Claim 16 for use in a vaccine.
- 20 19. A method of vaccinating an individual against a microorganism, the method comprising administering an antigen or polynucleotide according to Claim 16, or a vaccine according to Claim 17, to the individual.
- 25 20. Use of an antigen or polynucleotide according to Claim 16, or a vaccine according to Claim 17 in the manufacture of a vaccine for vaccinating an individual against a microorganism.
- 30 21. A method for making a polynucleotide the method comprising carrying out the steps of Claim 10 and isolating or synthesising the identified gene or a variant or fragment thereof or a fusion of such gene or variant or fragment.
22. A polynucleotide obtainable by the method of Claim 20.

23. A mutant microorganism obtainable by the method of Claim 11.
24. Any novel method for identifying antigens of microorganisms as herein  
5 described.
25. A polypeptide comprising the amino acid sequence selected from any one  
of SEQ ID Nos 4, 2, 6, 8, 10, 12, 14, 16, 18, 20, 22, 24, 26, 28, 30, 32, 34,  
36, 38, 40, 42, 44, 46, 48, 50, 52, 54, 56;  
10 or a fragment or variant thereof or a fusion of such a fragment or variant.
26. A polynucleotide encoding a polypeptide according to Claim 25.
- 15 27. A polypeptide according to Claim 25 or polynucleotide according to Claim  
26 for use in medicine.
28. A polypeptide according to Claim 25 or polynucleotide according to Claim  
26 for use in a vaccine.
- 20 29. A method for making a polypeptide according to Claim 25, the method  
comprising expressing the polynucleotide of Claim 26 in a host cell and  
isolating said polypeptide.
- 25 30. A method for making a polypeptide according to Claim 26 comprising  
chemically synthesising said polypeptide.
- 30 31. A method of vaccinating an individual against *Neisseria meningitidis*, the  
method comprising administering to the individual a polypeptide according  
to Claim 25 or a polynucleotide according to Claim 26.

32. Use of a polypeptide according to Claim 25 or a polynucleotide according to Claim 26 in the manufacture of a vaccine for vaccinating an individual against *Neisseria meningitidis*.
- 5 33. Any novel *Neisseria meningitidis* vaccine as herein disclosed.